



MEMORANDUM

City of Chicago
Richard M. Daley, Mayor

Department of
Procurement Services

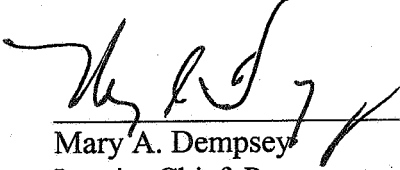
Mary A. Dempsey
Interim Chief Procurement Officer

City Hall, Room 403
121 North LaSalle Street
Chicago, Illinois 60602
(312) 744-4900
(312) 744-2949 (TTY)
<http://www.cityofchicago.org>

Date: May 3, 2005

To: Chris O'Brien, Chief Information Officer
Department of Business and Information Services

Attn: Molly Mangan

From: 
Mary A. Dempsey
Interim Chief Procurement Officer

Re: Emergency Purchase Order Authorization

Pursuant to Section 2-92-644 of the Municipal Purchasing Act, I am authorizing you to make an Emergency purchase from Pixxures, Inc. Based upon information received from members of your staff, I have determined that this procurement is necessary to meet bona fide operating emergencies.


You are hereby authorized to purchase Aerial Photography in the amount of \$153,800.00 as requested in your letter of April 28, 2005. Any amount in excess of the \$153,800.00 approved here shall be subject to additional authorization and shall be limited so as not to exceed the \$250,000 limit established by statute.

cc:S. Geocaris
B. Humphrey



Memo

To: Mary A. Dempsey
Interim Chief Procurement Officer
Department of Procurement Services

From: Chris O' Brien 
Chief Information Officer
Department of Procurement Services

Date: April 28, 2005

Re: Operational Emergency Procurement of Pixxures, Inc.

05/11/2005 11:5:00

On April 21, 2005, a request for aerial photography services was approved by the sole source committee on behalf of Pixxures, Inc., a Colorado-based corporation. Allowance for the immediate procurement of these services was explained by the committee to be contingent upon the provision of a written justification.

Pixxures, Inc. offers a high quality digital-based aerial photography that works with CAD and GIS data better than the conventional film-based. In order to obtain those aerial views with the least amount of tree coverage obstructions, the required flight must occur within the next few weeks of this memo's date.

Thank you for your consideration of our request. If further information is needed, please contact Molly Mangan, Deputy Chief Information Officer at x4-4822 or at mmangan@cityofchicago.org.

cc: M. Mangan/BIS
J.Mims/BIS

CITY OF CHICAGO
DEPARTMENT OF PURCHASES
CONTRACTS AND SUPPLIES
ROOM 403, CITY HALL, 121 NO. LA SALLE ST.

JUSTIFICATION FOR NON-COMPETITIVE PROCUREMENT

COMPLETE THIS SECTION IF NEW CONTRACT(S)

For contract(s) in this request, answer applicable questions in each of the 4 major subject areas below in accordance with the Instructions for Preparation of Non-Competitive Procurement Form on the reverse side.

Request that negotiations be conducted only with Pixxures, Inc for the product and/or services described herein.
Name of Person or Firm

This is a request for One-Time Contract per Requisition # _____ (copy attached) or X Term Agreement or Blanket Approval (Check one). If Delegate Agency, this request is for "blanket approval" of all contracts within the _____ (Attach List) (Program name)

S. S. R. B.
DATE 4/21/05
APPROVED... 50

COMPLETE THIS SECTION IF AMENDMENT OR MODIFICATION TO CONTRACT

Describe in detail the change in terms of dollars, time period, scope of services, etc., its relation to the original contract and the specific reasons for the change. Indicate both the original and the adjusted contract amount and/or expiration date with this change, as applicable. Attach copy of all supporting documents. Request approval for a contract amendment or modification to the following:

CONDITIONALLY
APPROVED...
RETURN TO DEPT...
DISAPPROVED... _____

Contract # _____ Company or Agency Name:
Specification # _____ Contract or Program Description:
Mod # _____ (Attach List, if multiple)

Judy Mims x2-1817

[Signature]

BIS

4/15/05

Original Name Telephone Signature Department Date
Indicate SEE ATTACHED in each box below if additional space needed:

(X) PROCUREMENT HISTORY

All departments within the City of Chicago use annual **Aerial Photography** of the City to work with Geographical Information Systems. Aerials are used for infrastructure planning, legal cases, alignment of CAD and GIS data, permits, sound insulation analysis, and environmental analysis. In the past, BIS has periodically purchased off-the-shelf data for this purpose. We have a need for better quality photography to support Aviation and utility-based departments.

(X) ESTIMATED COST (Funding: 05-100-06-2005-0149-0149; 04-0453-06-2005-3033-4503301)

The photography acquired will cover the entire City of Chicago boundary area, plus a two mile buffer around each airport to address needs of the Department of Aviation. This project will be jointly funded by BIS and Aviation at a cost of **\$153,800**. Photography produced will have 6-inch resolution and be corrected for building lean shadows.

(X) SCHEDULED REQUIREMENTS

In order to obtain aerials without tree coverage obstructions, the required flight needs to occur **prior to April 22, 2005** and the vendor requires a week of lead-time for preparation.

(X) EXCLUSIVE OR UNIQUE CAPABILITY

New technology allows the acquisition of **digital** (rather than film-based) aerial photography. This will allow the City to use automated change detection software in the future to identify differences (new buildings and roads) from one year to the next. Because this technology is relatively new, commercial sources of this data are not available.

Pixxures, Inc. is one of few vendors with the ability to digitally capture this photography for a custom Chicago flight. For the first time, we will have full ownership of the resulting photography which will allow distribution to sister-agencies. This first year will allow us to measure the feasibility of a digital program and assess our specification needs. Going forward, vendor migration in this direction will allow us to competitively bid a multi-year program with precise specifications.

(X) OTHER

APPROVED BY: *[Signature]*
Department Head
Or Designee

4/15/05
Date

[Signature]
Board Chairperson

4/21/05
Date

INFORMATION TECHNOLOGY STRATEGY COMMITTEE COMPUTER EXPENDITURES/SERVICES REVIEW FORM

Department requests for hardware/software and consulting services must be submitted to the Commissioner of Business and Information Services for review and approval prior to procurement of goods and/or services.

BIS
Department Name

Aerial Photography
Program Name

04/05/05

Date request was initiated

Justification: Describe in detail; where products should shipped, PC imaging (if any), and why products or services needed.

Sole Source Request for

Pixures, Inc.

15000 - W. 64th Ave.

CO 80007

Requests will not be processed without valid funding strip.

FY	FUND	DEPT	ORGN	APPR	OBJT	ACTV	RPTG (Grants Only)	PROJECT # (Enotes Only)
05	100	06	2005	0149	0149	0000	0000	00000000

Funding Strip

S. Mims
Originator's Name (Please Print)

Contract Coordinator
Originator's Job Title

42-1817
Originator's Phone Number

ITSC Signature

APPROVALS

[Signature]
Department Head Signature (No Substitutes)

04/06/2005

ITS Committee Approval/Disapprove Date

(Assigned By BIS)

ITS Committee #

Commissioner of BIS Signature

PG# For Order

0917479704

② 04-0453-06-2005-3033-4503301

Scope of Services/Approach to the Project

Scope of Work/Technical Specifications

All photography acquisition, flight planning and quality control checks will be conducted in coordination with Pixxures and Digital Aerial Solutions, Inc. of Tampa, FL. Flight operation includes Airborne GPS/IMU and image acquisition to Level 0 products. All supplemental ground control, Analytical Aero-triangulation (AT) and ortho-rectification will be completed by Pixxures, Inc. Pixxures has worked successfully on similar programs with both flight organizations. In addition, the use of newly established controls, we will import the City of Chicago's existing DTM (mass-points and break-lines) as vertical control, and the City's existing orthophotography from the previous flight as horizontal control. The resulting accuracy of the 2005 flight is dictated by the inputs as the accuracy can only be duplicated.

Project Area Defined

The area to be flown and orthophotography produced consists of "The City of Chicago and Aviation" boundary, totaling 441.45 square miles. This PDF file illustrating the area of interest was provided by your office on March 3, 2005 and was used in deriving the project fee and completion schedule. Should the City elect to proceed, we will require a Shape File depicting this boundary to assist in verifying the boundary and finalizing our flight plan to ensure complete coverage. (Shape file received 3/4/05.)

Accuracy Issues And Our Commitment To the City of Chicago

Our proposed approach will ensure the spatial integrity of the current City provided inputs (DTM's and Orthophotography) are duplicated. Although the information to be provided by the City should be suitable to achieve this goal, Pixxures has added additional Ground Control Points (GCP's) to strengthen the solution and end result. We understand the accuracy of the City provided materials to be: National Standard for Spatial Data Accuracy, the final DTM meet or exceeded 0.67056000 meters (2.2 feet) horizontal accuracy at the 95 percent confidence level (Accuracy = RMSEr x 1.7308), and 0.18288000 meters (0.6 feet) vertical accuracy at the 95 percent confidence level in open terrain (Accuracy = RMSEr x 1.9600). Horizontal accuracy of the orthophotography meets this standard as well.

Project Approach

The City of Chicago proper presents a challenge in that the presence of tall buildings can negatively affect the usefulness and aesthetic value of the resulting imagery, if not properly planned for and effectively dealt with. Specifically, building lean toward the edges of the exposure causes misalignment from flight line to flight line, as well as in the forward direction using a traditional analog frame camera. In addition, severe building lean causes heavy shadowing that will obstruct ground features at the base of such structures. (City will provide intelligence on building height location to assist.)

The best technology available, and proposed for use on this project is the Leica push-broom digital sensor. This sensor configuration scans left to right at NADIR, which drastically minimizes building lean in the forward (flight line) direction. Building lean at the edge of the imagery is addressed effectively by increasing side-lap between flight lines. Our proposed approach (flight plan) includes increasing side lap up to as much as 80% in the congested areas of tall buildings. A direct digital sensor has drastically increased radiometry to enable viewing detail in areas of shadowing. (I.e. Analog film offers 256



variations of tone per pixel, while the ADS40 direct digital sensor offers 4096.) The result is higher quality imagery offering more detail and value to the City of Chicago.

The project will be planned using the direct digital ADS40 camera flying at an altitude of 4800' above mean terrain (AMT). We will produce all products from this flight. Each flight line will extend beyond the project boundary to ensure sufficient coverage. All required coordination with FAA would be made to ensure permission is granted and all airspace regulations are strictly followed. The Chicago Department of Aviation will provide contacts to assist Pixxures' effort.

Aerial Imagery

We will obtain new aerial imagery beginning no sooner than March 18th and no later than when vegetation has blossomed, estimated currently to be the 3rd week in April, 2005 utilizing ADS40 digital camera technology. You may purchase B&W data, Color data or both. The color option has been included in our pricing structure as the base product. The creation of other deliverables would be a slightly additional fee added to this base product.

The City of Chicago can assist our aerial capture effort by notifying us about limitations or acceptable amounts of snow (small, scattered locations) and flooding conditions.

Airborne GPS and IMU data is field processed to ensure that GPS satellite geometry and IMU data will support the accuracy requirements. Imagery for each day of acquisition will be downloaded to hard disks and shipped overnight for processing. Preliminary processing of the data will occur within 48 hours of the initial acquisition. This will ensure that any reflights can be obtained promptly while the aircraft and crew are on site.

All flights will operate in accordance with FAA regulations, and in cooperation with local air traffic controllers.

AERIAL IMAGING SPECIFICATIONS	
Flight Height (Above Mean Terrain)	4800-ft.
Photo Scale—film equivalent	1"=800'
Digital Images	Color (B&W / Infrared – optional)
Flight Line Miles	800
Number of Flight Lines	50 plus
Ground Control	5-12 targets plus one point at a local airport

Control

We will be using Airborne GPS combined with an Inertial Measurement Unit (IMU) to provide a more consistent and stronger control network, providing greater overall horizontal accuracy. We will coordinate the furnishing of all ground control necessary to support aero-triangulation. The City provided orthophotography would serve to supplement control if/where required.

If time allows, and does not jeopardize the flight schedule, each control point will be targeted prior to flight. Each point will be paneled using 1-ft. x 5-ft. material for each of **four legs** in a cross formation (+). Total target length to be 10-ft. Clearly identifiable features will be surveyed as post control, if time for targeting is not provided. Either is acceptable to meet the requirements of this program.

Project Vertical will be based on NAVD88 Datum. Horizontal Control will be referenced to the Illinois State Plane Coordinate System (East, Zone Number 1201), NAD83 U.S. Survey.

The following guidelines shall be followed when providing ground control survey for Airborne GPS projects:

- The airborne GPS ground station used for airborne GPS operations shall be tied in with the surrounding control network. The ground survey network shall be tied to a **NSRS** (National Spatial Reference System) **GPS** control point of second-order or better horizontal/vertical accuracy. The basis of the control network shall be clearly stated.
- Latitude, Longitude and Ellipsoid Height shall be provided in NAD83. Ellipsoid values shall be provided, and the Geoid model that was used must be stated. Coordinates shall be provided in a digital ASCII file with Point #, Latitude, Longitude, and Ellipsoid height in space or comma delimited format transmitted via floppy disk, CD-ROM or e-mail. These coordinate values shall be in decimal degrees.
- Coordinate values in the coordinate system requested shall be provided as well as orthometric height for each control point. The horizontal coordinate system (i.e. NAD83), vertical coordinate system (i.e. NAVD88), units (i.e. International Feet) and Geoid model used, shall all be clearly stated. Both ground and monument elevations shall be reported. If a monument is not flush with the ground the elevation of the monument and the ground shall be provided. Coordinates in the project coordinate system shall be provided in a digital ASCII file with Point #, Easting, Northing, and orthometric height in space or comma delimited format transmitted via floppy disk, CD-ROM or e-mail.
- Field and post processing procedures, adjustments, quality control procedures, equipment, and software used, shall all be stated.
- The GPS data files in Trimble raw format or RINEX format shall be available as it may be requested as a deliverable on CD-ROM or ZIP disk.

NOTE: All horizontal and vertical control should be to an accuracy level of NGS Second Order or better. This accuracy is achievable when NGS-58 procedures are used and when NSRS monuments are included in the GPS network.

Aero-triangulation

GPPO Digital Camera Aero-triangulation -- Level 1 epipolar-resampled and georeferenced imagery usually will provide a pixel's true ground location to within a few pixels, without any additional processing. To improve accuracy a fully automatic aero-triangulation process can be performed to minimize the residual errors in the GPS/INS derived exterior orientations. The aero-triangulation also allows the introduction of ground control and checkpoints to ensure the accuracy specifications are achieved.

Automated aero-triangulation of ADS40 imagery is performed with the same software used for conventional frame photography, the Socet Set Automatic Point Measurement (APM) tool. Because the ADS sensor provides 100% stereo forward overlap vs. 60% for conventional frame photography the process results in orientation/positional accuracies to the sub-pixel level in less time than required for the same process with film imagery, but requires significant computer processing resources.

The aero-triangulation process provides full-bundle adjustment. The bundle method of aero-triangulation provides a simultaneous adjustment solution of collinearity equations, representing all the image rays in a block of imagery. The output includes adjusted ground coordinates of each ground intersection point, as well as the sensor position and orientation values required for mapping.

Quality Assurance/Quality Control

Factors such as documented procedures and checklists, adherence to work flow diagrams and QC checkpoints, supervision and reviews; are strictly followed. Redundant checks are made as a project flows from one department to the next. If any problems are noted, the project is returned to the previous department for corrections. Each project is tracked through the office via a projects database, which is updated daily. Project Managers ensure that the contract details are communicated to all staff by way of written documents for each department, detailing the specific requirements of each job. Project Managers follow through on each of their projects with daily communication with the different departments involved with the project. Timely correspondence with the client via e-mail or telephone keeps the client abreast of their projects' progress.

Pixxures, Inc. is a progressive photogrammetry and remote sensing company. Our goal is to make our clients successful in their endeavors while we remain a market leader in the production of aerial mapping products and services.

Pixxures, Inc. will accomplish these goals by:

- *Providing a working environment of continuous improvement*
- *Delivering products and services on time and of the highest quality*
- *Meeting or exceeding customer expectations*
- *Satisfying the requirements of the quality management system*
- *Measuring and improving operational performance*
- *Complying with regulatory and statutory requirements*

Management will demonstrate a commitment to quality by providing resources, and establishing and reviewing quality objectives that will promote continual improvement and achieve total quality performance.

All departments are involved in quality control. Within each department and in conjunction with client personnel, specific quality control checks are built into all production processes. Further, to promote continuous improvement, management encourages technical and administrative change with regard to quality procedures and incorporates such process changes into the standard operating procedures of the corporation.

This approach means that our team, rather than our clients, assumes the cost of quality control (in terms of time and human resources). Clients are required, however, to participate in the development of project specifications and are encouraged to be a partner in project development and execution. We coordinate to match our in-house processes to those used by our clients, further customizing and incorporating quality control into all procedures and processes to make quality integral throughout each project. Quality control, as a result, occurs throughout the life of a project and not simply as a final review.



Grid-Based Image Tiles

Pixxures has an internally developed application that automatically generates image tile extents from customer supplied ESRI format shape files. Options available within this application include the ability to generate edge-matched or overlapping tiles based on client specifications. Pixxures will derive a tile configuration and discuss it with the City for approval.

Following the tonal balancing and application of seamlines to the orthorectified imagery, the resulting mosaicked imagery is exported and cut to the geographic coordinate extents identified within the tile definition file.

Our Quality Assurance and Checking Procedures for proper tone balancing and overall image quality are conducted after each step of the production process. Beginning with TTC Curves, and continuing with Image Equalizer, Interactive Seamline Editor, Producing Large Tiles to the final step of cutting images to the Customer's Grid Scheme. Detailed descriptions of processes follow.

Ortho-Rectification

The ortho-rectification process uses the raw Level-0 data as the input imagery source to avoid repeated re-sampling of the imagery to yield the best possible image quality and accuracy. The raw Level-0 imagery is ortho-rectified to the DTM (including break-lines), using the adjusted position and orientation results from the aerial triangulation phase. The ortho-rectified strip of imagery is called the Level-2 data. This process is also optimized to ortho-rectify multiple strips to the Level-2 stage in parallel to drastically reduce the turn around time.

Pixxures has developed a custom in-line parallel processing system for the ADS40 data that is built off of Leica's GPro software and integrated with advanced custom SOCET SET routines. Our systems utilize high-end super-computing cluster architecture to accelerate the workflow and manage the large data sets efficiently. We have developed a heterogeneous cross-platform processing line that utilizes both Linux and Windows operating environments. We have accelerated the digital workflow by combining the stability of Linux-based servers for dataset hosting with Windows-based SOCET SET processing in a super-computing configuration and integrating our own proprietary 64bit processing. Our system is built off 52TB of storage capacity, 30 Linux Servers with a 30Gb backbone, 60 Linux workstation, 30 Windows based workstations, a 2000BaseT (2Gb) Fiber Optic ethernet LAN core, and 1000Base T (1Gb) ethernet on Cat5e cabling.

Level 2 ortho's are QC'd for radiometric and geometric quality and then copied from the ADS40 processing server systems to the final map production server systems. Again, redundancy is crucial and copies are verified and cataloged by our production team. Our server systems are running either Linux Red Hat 7.3 customized kernels for stability, or the latest Windows 2000 Server configurations. Output resolution will be 6 inch for the designated area. The 6-inch imagery will be output at the desired 100 scale.

Pixxures Radiometric Correction and Image Equalization Procedures for the ADS40

Pixxures uses a customized workflow to normalize and equalize the radiometry of the ADS40 imagery after the geometric rectification requirements have been met. Pixxures utilizes a series of processes to achieve the correction and maximize the radiometric quality of the L2 imagery.

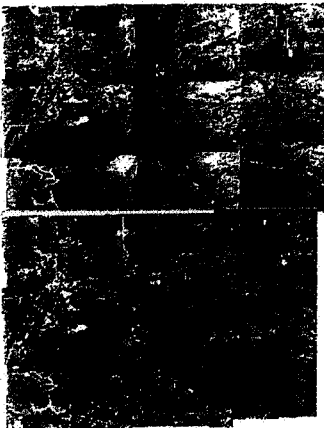
Our process begins by first identifying the significant number of bits that the sensor utilized during collection, which can vary according to changing light conditions and differing terrain. We begin by creating 16-bit L2 images and inspecting the radiometric signature of these test strips. Our radiometry team then applies a linear correction to the L2 16-bit test areas to expand the radiometry of all three color bands - Red, Green, Blue (R, G, B). Since the ADS40 typically collects RGB imagery in 11-bits, our initial curve settings are simply used to "stretch" the initial histogram. From this point our radiometry team adjusts the correction curve to maximize the histogram settings and also applies a few minor adjustments to balance the individual bands to reduce atmospheric effects in the Blue band. The resulting TTC curves are saved and used by GPRO during the final L2 rectification process. If the final deliverable is to be an 8-bit product, a resample from 16-bit to 8-bit is performed concurrently with the TTC curve adjustment during the final rectification stage.

Once the L2 images are created with the proper geometric rectification and TTC expansion, Pixxures employs Image Equalizer software on the strips to balance the normalized images and remove the gradient caused by the line sensor geometry and atmospheric effects. During this process minor adjustments are made to balance the imagery by strip to meet an overall, acceptable tonal average. This process creates a properly adjusted and balanced strip of imagery, which is cut into one or two gigabyte pieces that are ready to be imported into OrthoVista Image Processing Software for final processing.

Mosaicking

The resulting images will be color balanced and mosaicked using OrthoVista and other image processing tools developed by Pixxures.

The major features of the OrthoVista software include (Example represents analog film):



- Radiometric image balancing and mosaicking
- Single image enhancement like dodging, hot spot removal and color corrections
- Global image balancing
- Geometric mosaicking of orthoimages
- Automatic correction of color variations and vignetting

An interactive (manual) cutline editor will be used to determine the exact placement of all cutlines. This will minimize the ability of the end user to detect image cutlines and ensure that no cutlines will be placed through areas of interest, e.g. buildings or roads.

A final image quality check will be conducted at this time.

Finally, the mosaicked images are cut to their final image tiles based on the tiling and naming scheme specified agreed upon.

Each of the steps described is followed by a Quality Assurance/Quality Control (QA/QC) function to quickly identify and address unsatisfactory product and minimize cost by removing it from the production flow early to avoid redundancy in process.

Digital Orthophoto Image QA

- Aerial images and final tiles are reviewed by a Pixxures Senior Image Analyst for clarity, contrast, shadow detail, consistency and sunspots.
- DEM/DTM data provided is graphically displayed relative to the project boundary to ensure that all areas are covered and will be correctly rectified.
- Senior Image Analyst validates that the DEM/DTM blocks overlap to ensure that there are no data gaps between blocks of imagery.
- Senior Image Analyst reviews the location of seam lines and manually modifies them to avoid elevated objects and to place them in monotone areas (through open fields, along road centerlines, etc.).
- Senior Image Analyst reviews the block-wide image characteristics and modifies a global histogram as necessary to adjust the overall tonal balance.
- Tonal balancing on a project-wide basis is reviewed to ensure consistent imagery.
- Using PixQA, a final visual inspection of each tile is completed for aesthetics and anomalies (e.g. building and bridge lean, cut line visibility, etc.).
- Pixxures will complete a pilot area and provide to the city for review and approval prior to moving forward with full production.

Acceptance and Rejection

Over the course of our tenure in the mapping industry, we have developed a robust set of tools to aid in map update, quality review, and deliverable generation. We have an appreciable amount of experience in generating high quality digital orthophotos and related vector products, and would bring those tools and experience to bear on this project. Included in our project approach is the continuous interaction with project management during project completion, and the use of sample data as review checks on a consistent basis. We would distribute a Pixxures proprietary image review tool to all interested parties so that image chips showing issues or notable features can be distributed via e-mail for review and comment to aid in acceptance and rejection notification.

QA Approach

After reaching the Level-2 ortho stage, all imagery will be visually inspected during the manual placement of seamlines. The placement of seamlines will help to insure adequate coverage of the AOI, but it will also aid in identifying any tonal variations that need to be addressed, prior to the mosaicking stage. When the seamline placement is complete, an alternative Image Analyst will perform a peer-review to verify that the seamlines were initially placed in the best possible locations.



Once the placement of the manual seamlines is completed, tonal balancing and mosaicking in OrthoVista is complete, the resulting tiles will be manually inspected once again. During this inspection, Senior Image Analysts will identify and remove any unwanted visual artifacts that may exist, in addition to the verification that seamlines were applied correctly in the mosaicking process. Following the visual inspection and any needed editing, the tiles will be cut and named according to a tiling scheme agreed upon by Pixxures and the City of Chicago, prior to being written to media.

As with all other stages of production, any and all issues will be communicated to the Pixxures' Project Manager on a daily basis. The Project Manager will insure that all other involved parties are informed about items of concern. This sharing of information will help to insure consistency throughout the project by making sure all Image Analysts involved in processing and QA/QC are aware and familiar with any items of concern and the methods to use in resolving those issues.

As the final processing location for all imagery products that have been outlined in this proposal, Pixxures will exercise a multi-level Quality Assurance/Quality Control (QA/QC) plan. Pixxures QA/QC procedure plan will reiterate the project specifications and requirements for accuracy and quality from the beginning of flight, throughout the product life cycle and through the shipment and subsequent acceptance of the final deliverables.

Schedule for Completion of Services

Delivery Schedule

For the City of Chicago Project, we anticipate the following schedule. (Schedule will be 3-months after completion of all aerial photography or completion of ground control, whichever is later.)

Aerial Data Acquisition (weather permitting): ** Ground control panels will be set prior to flights	March 18th – April 20 th (Leaf-off required.) (Schedule is 3-months after image acquisition.)
AT and Processing to Level 1B Imagery	30-days after flight & QC
DTM/DEM QC and Formatting	7-days after Level 1B
Ortho-Production and Final Tile	45-days after DTM formatting
Final QC and Delivery of Project	5-days after final tile
<i>Final Review and Acceptance Period (by City)</i>	<i>30-days after delivery</i>

Progress Reporting Strategy

Pixxures uses forms developed in conjunction with our Project Management approach to report project progress. We have found by using our **Project Status Report** (See Appendix for sample) in combination

with the project schedule, all Stakeholders are kept abreast of the project's progress on a to be determined schedule.

Our **Project Status Report** covers key aspects of the project. In particular, **Scope Change, Resource Constraints, Milestone Date Objectives**, and any other **Issues** that may impact delivery schedule.

Typically, we recommend that progress reports are updated and distributed weekly. However, we have the capability to either increase or decrease the reporting level depending upon the client's needs.

Obligations of the City of Chicago

Items to be Provided by the City of Chicago

1. Shape file (provided on 3/4/05) depicting the official project boundary.
2. City will work with Pixxures to agree on Pixxures suggested tiling scheme.
3. Provide contacts through Chicago Department of Aviation to assist with flight planning and image acquisition if possible.
4. Possible coordination with public lands access to help expedite the survey effort.
5. Notify and provide Pixxures with existing GCP's or other controls set and/or utilized on previous mapping efforts if available.
6. Provide available controls including existing orthophoto's and DTM's. Proposal assumes needed break-lines and mass-points exist to support the desired accuracy. If additional DTM (mass points and break-lines need to be generated to support the desired product, additional effort and therefore fees will be discussed.
7. Adequate resources to perform quality control of both the pilot project and the full production effort to keep project on schedule.

The client's acceptance period of all data shall be 30 days from date of transmission, after which time the client shall assume full responsibility and sole risk for its use.

Project Management Philosophy

Project Team

As part of our commitment to the City of Chicago Project, we have designated Mr. Robert Gilmore, CFO, as Contracts Administrator for this project. He will be supported in maintaining a "Total Quality Philosophy" by the entire project team, which includes Mr. Charles Killpack, CEO, Mr. Larry Schaner, VP Sales, Mr. John Russell CTO, Mrs. Wendy Luck, Production Manager, Mr. Mark Stanton, Senior Technical Manager, and Randy Bowman, Project Manager.

Larry Schaner will be the primary point of contact until such time the project manager takes control. Mr. Schaner may be reached by phone at (303) 302-8543 and via e-mail at lschaner@pixxures.com. Mr. Bowman may be reached at (303) 302-8558 or via e-mail at rbowman@pixxures.com. Both of these

individuals work at our Pixxures' headquarters located in Arvada, Colorado. Pixxures' proposed project team has worked together on projects ranging from 15 to 20,000 square miles in area and team members have from 5-22 years of experience in the digital mapping industry.

Our Philosophy

Pixxures firmly believes the number one reason for missed project deadlines, poor quality of work, and cost overruns are due to incorrectly defining project requirements. In other words misunderstanding the customer's expectations.

In order to alleviate these problems Pixxures has implemented proven project management standards and practices that are embraced by PMI (Project Management Institute) and detailed in the PMBOK (Project Management Body of Knowledge).

Understanding customer's expectations begins with the Project Kick-Off meeting. This meeting consists of all stakeholders either in person or via conference call where we will discuss at the minimum the purpose of the project, scope, communication requirements, deliverables, risks, assumptions, budget, and schedule.

We have also developed and implemented forms that are used during the Project Life Cycle. These forms include; Project Kick-Off, Risk Analysis/Contingency Planning Report, Project Status Report, Project Issue Log, Earned Value Report, Change Order Form, and Change Order Log.

We have found by utilizing these forms the communication flow remains open. This allows all stakeholders to have access to the same information creating an environment, which fosters problem solving, and innovative ideas.

The Pixxures' Project Manager also assumes responsibility for the performance and responsiveness of all subcontractors that participate in the project. Specifications for each company's respective project portions are communicated in writing and the availability of resources is confirmed. The Project Manager monitors subcontractor progress and quality assurance procedures throughout each phase and deals with any quality or delivery issues directly.

Following is a summary of some, but not all anticipated Pixxures' Project Manager functions. The Project Manager is ultimately responsible for project compliance to the scope of work. The Project Manager will:

- Communicate technical specifications and schedule requirements to department managers, subcontractors and key staff on the Project Team.
- Work with the flight contractor in preparation of flight planning, focusing on efficiency of both aerial capture and production.
- Continually communicate with flight contractor throughout the duration of the project to assess progress and ensure scope of work is adhered to.
- Provide frequent communication with the Client Project Manager during aerial data acquisition period via phone or e-mail (to be agreed upon by both parties).
- Develop and implement a production plan with key managers and oversee compliance throughout the project.
- Quality check digital images to assess adherence to both Pixxures and City of Chicago specifications.
- Continually track project status internally using Customer Resource Management guidelines and post updates on the secure, online Project Status application.
- Prepare and deliver required interim status reports to the City of Chicago project Manager.

- Interact with City of Chicago representatives to efficiently and accurately resolve any issues that arise.
- Confirm QA/QC results at each production step and sign-off on each phase, allowing the next step to proceed.
- Continually assess use of internal resources and reevaluate/reassign as required to maintain project schedule.
- Assess areas of potential for improved efficiency.
- Lead "project completion" discussion for each final deliverable.

In summary, Pixxures Project Management philosophy is derived from our commitment to quality, responsiveness to our customers, flexibility in creating solutions, and our desire to make our customer's job as easy as possible. As with any relationship, a combination of clear expectations, good communication and mutual respect between partners results in fewer problems to solve and a smooth path to success.

Cost Proposal

The proposed cost to capture the aerial imagery and produce six-inch resolution color orthophotography for the 441.45 square miles will be \$153,800.00.

Deliverables

Delivery will consist of orthophoto tiles cut to agreed upon scheme in TIF Format with associated .tfw.

All TIF images shall be delivered on FIREWIRE drives. (Three total copies delivered on three separate 300 GB FIREWIRE drives.) All 1:20 compression MrSIDs will be delivered on DVD. Three sets will be delivered and require 2-DVD's each.

Payment Schedule

The following are suggested milestone payments and associated dollar amount for your consideration. Pixxures requires the support of expert subcontractors. Those specific responsibilities include Ground Control and pre-flight paneling (of said ground control), along with acquisition of the aerial imagery. Breakdown of subcontractor costs include:

Ground control acquisition and paneling	\$10,000.00
Aircraft mobilization and Aerial image acquisition (IMU/ABGPS) ...	\$65,000.00
Internal production milestones and associated costs include:	
Completion of the Analytical Aero-Triangulation	\$25,000.00
Completion and acceptance of the Pilot project	\$10,000.00
Completion of the image ortho-rectification (50% complete)	\$12,500.00
Completion of the image ortho-rectification (100% complete)	\$12,500.00
Final delivery of ortho-rectified imagery	\$10,000.00
Delivery of MrSID's (completes 100% of contract)	\$8,800.00

Milestone items and associated amounts can be combined as agreed upon to accommodate City of Chicago invoicing policies.

CPAC PROJECT CHECKLIST

For CPAC Team Use Only	
Date Received:	_____
Date Returned:	_____
Date Accepted:	_____

IMPORTANT: PLEASE READ AND FOLLOW THE INSTRUCTIONS FOR COMPLETING THE PROJECT CHECKLIST AND CONTACT THE APPROPRIATE TEAM LEADER IF YOU HAVE ANY FURTHER QUESTIONS. ALL INFORMATION SHOULD BE COMPLETED INCLUDING THE SUPPLEMENTAL CHECKLIST REQUIRED BY THE SPECIFIC CPAC TEAM. ATTACH ALL REQUIRED MATERIALS AND SUBMIT FOR HANDLING TO THE DEPARTMENT OF PROCUREMENT SERVICES, ROOM 403, CITY HALL, 121 N. LASALLE STREET, CHICAGO, ILLINOIS 60602.

PROJECT 4/5/05
 Date: 4/5/05
 ID No (Spec, RX, Project): new request
 Department: BIS
 Bureau: GIS division
 Contract No (if known): _____
 Project Title/Description: Aerial Photography

Contact Person: Molly Morgan
 Tel: _____ Fax: _____ E-mail: _____
 Project Manager: _____
 Tel: _____ Fax: _____ E-mail: _____
 Estimated Value \$ _____

SCOPE STATEMENT

attached is a detailed scope of services and/or specification

IMPORTANT: THIS IS A CRITICAL PORTION OF YOUR SUBMITTAL. IN ORDER FOR A TEAM TO ACCEPT YOUR SUBMITTAL YOU MUST COMPLETE ALL TEAM SPECIFIC SCOPE REQUIREMENTS AS SET FORTH IN THE SUPPLEMENTAL CHECKLIST FOR THAT TEAM.

The following is a general description of what would be included in a Scope of Services or Specification:
 A clear description of all anticipated services and products, including: time frame for completion, special qualifications of prospective vendors, special requirements or needs of the project, locations, anticipated participating user departments, citation of any applicable City ordinance or state/federal regulation or statute.

TYPE OF PROCUREMENT REQUESTED (check all that apply)

Competitive Bid RFQ/RFP/RFS/RFI Sole Source** Term Agreement One Shot
 Mod/Amendment Time Extension Additional Funding Small Order S/O Emergency

FORMS

F-25* (add line item) F-10* (special approvals) SSRB** (sole source approval)
 F-26* (new term agreement) RX (one-shot requisition) OBM Authorization
 F-27* (time extension) APRF (all purpose request form)
 F-29* (change vendor limit)

** Sole source requests must include vendor quotes/proposal and MBE/WBE compliance requirements

FUNDING

City: Corporate Bond Enterprise Grant* Other
 State: IDOT/Transit IDOT/Highway Grant* Other
 Federal: FHWA FTA FAA Grant* Other
 Funding Strip(s): 05-100-06-2005-0149-0149
04-0453-06-2005-3033-4503301
 * Attach copy of any applicable grant agreement terms and conditions

TIME FRAME

Date Needed: by 4/21/05 Requested Contract Term (y/m/d): 3 yr extension
04/21/05

PRE BID/SUBMITTAL REQUIREMENTS

Requesting Pre Bid/Submittal Conference? Yes / No Requesting Conference be Mandatory? Yes / No
 Requesting Site Visit? Yes / No Requesting Site Visit be Mandatory? Yes / No

CPAC PROJECT CHECKLIST

DELEGATE AGENCY SUPPLEMENTAL CHECKLIST

Required attachments:

Attach Scope of Services that includes the following information 1) Program background & objectives; 2) Type of services for which proposals are sought; 3) Location and time line for delivery of services; 4) Qualifications, skills, and/or experience necessary; 5) Special licenses or certifications required; 6) Evaluation process (if known).

Other Attachments (please submit all that apply)

1. Copy of grant application and/or grant agreement
2. Evidence of award authority (DAAC agenda with agency name highlighted; City Council ordinance with agency name highlighted; or OBM letter)
3. Modification information (Copy of Form F-8A; screen print of EPS AWDS table)

Does program require Executive Order 91-1 clearance?

Yes No

Is boilerplate from Law available or in production?

Yes No

Would your department benefit from technical assistance?

Yes No

HARDWARE/SOFTWARE SUPPLEMENTAL CHECKLIST

ITSC (approved by BIS)

OBM (approved by Budget form/memo)

Attach any documentation indicating any previous purchase activity to assist in the procurement process

Grant document attached

PROFESSIONAL SERVICES SUPPLEMENTAL CHECKLIST

Detailed scope of services as described on page 1.

The Schedule of Compensation

Deliverables

Request for individual contract services (if applicable)

The appropriate EPS form

* If this is a Telecommunications/Utilities project, please also address the following:

Has the project been reviewed by DGS? Yes No

Attach copy of DGS Recommendation; Reservation(s); or participate under current contract.

Does the project include software? Yes No

If yes, is signed ITSC form attached? Yes No

Does the location involve:

A public way? Yes No

Any concession in the City's facilities? Yes No

Is it anticipated City Council approval of the project or contract will be required? Yes No